WHAT IS CLAIMED IS:

1. A ferromagnetic semiconductor composition, comprising:

a substrate layer; and

a ferromagnetic semiconductor epilayer formed on the substrate, said epilayer defining a plane and having a cubic hard axis;

wherein a voltage transverse to said cubic hard axis is detectable in response to an applied current flow along the cubic hard axis.

2. The composition of claim 1, wherein the application of an in-plane magnetic field, non-aligned with the cubic hard axis, produces a transition in the transverse magnetic resistance of the epilayer.

3. The composition of claim 1, wherein the applied in-plane magnetic field is sufficiently strong such that the transition is substantially abrupt.

4. The composition of claim 1, wherein the substrate is a GaAs substrate, and wherein the epilayer includes Mn doped GaAs ((Ga, Mn)As)).

5. The composition of claim 4, wherein the concentration ratio of Ga to Mn in the epilayer is approximately 948 to 52.

6. The composition of claim 4, wherein the concentration ratio of Ga to Mn is between approximately 100:1 and 100:8.

7. The composition of claim 1, wherein the substrate is selected from the group consisting of GaAs and GaN.

8. The composition of claim 1, wherein the epilayer is selected from the group consisting of Mn doped GaAs and Mn doped GaN.

9. The composition of claim 1, wherein the substrate includes a buffer layer formed thereon and disposed between the substrate and the epilayer.

10. The composition of claim 9, wherein the buffer layer includes p-type GaAs.

11. The composition of claim 10, wherein the p-type GaAs is Be doped GaAs.

12. The composition of claim 10, wherein the epilayer includes Mn doped GaAs.

13. The composition of claim 12, wherein the buffer layer is approximately 300 nm thick and wherein the epilayer is approximately 150 nm thick.

14. The composition of claim 1, wherein the epilayer is between approximately 10 nm thick and approximately 350 nm thick.

15. The composition of claim 1, wherein the epilayer is formed by molecular beam epitaxy.

16. A ferromagnetic semiconductor device, comprising:

a substrate defining a plane;

a ferromagnetic semiconductor epilayer formed on said substrate, said epilayer being substantially elongated and oriented along a cubic hard axis; and

first and second electrical contacts, each contact coupled to an end of the elongated epilayer, said contacts being configured to provide an electrical current flow along the hard axis;

wherein application of an electrical current flow along the hard axis produces a voltage substantially transverse to said hard axis.

17. The device of claim 16, further including first and second transverse voltage probes coupled at opposite sides of the elongated epilayer, said first and second probes being substantially equidistant from an end of the epilayer, wherein said voltage probes detect said transverse voltage responsive to said current flow.

18. The device of claim 16, further including a plurality of transverse voltage probe pairs, each pair including a probe coupled at opposite sides of the epilayer, each pair defining a voltage detection region substantially perpendicular to the cubic hard axis.

19. The device of claim 16, wherein application of an in-plane magnetic field, non-aligned with the cubic hard axis, produces a transition in the transverse magnetic resistance of the epilayer.

20. The device of claim 19, wherein the applied magnetic field is sufficiently strong such that the transition is substantially abrupt.

21. The device of claim 16, wherein the substrate is a GaAs substrate, and wherein the epilayer includes Mn doped GaAs ((Ga, Mn)As)).

22. The device of claim 21, wherein the concentration ratio of Ga to Mn in the epilayer is approximately 948 to 52.

23. The device of claim 21, wherein the concentration ratio of Ga to Mn is between approximately 100:1 and 100:8.

24. The device of claim 16, wherein the substrate is selected from the group consisting of GaAs,and Mn doped GaN.

25. The device of claim 16, wherein the epilayer is selected from the group consisting of Mn doped GaAs and Mn doped GaN.

26. The device of claim 16, wherein the substrate includes a buffer layer formed thereon and disposed between the substrate and the epilayer.

27. The device of claim 26, wherein the buffer layer includes p-type GaAs.

28. The device of claim 27, wherein the p-type GaAs is Be doped GaAs.

29. The device of claim 27, wherein the epilayer includes Mn doped GaAs.

30. The device of claim 16, wherein the epilayer is between approximately 10 nm thick and approximately 350 nm thick.

31. The device of claim 16, wherein the epilayer is formed by molecular beam epitaxy.

32. A method of measuring magnetic domain wall parameters in ferromagnetic-semiconductor materials, comprising:

providing a test sample including a ferromagnetic semiconductor epilayer formed on a substrate, said epilayer being substantially planar and having a cubic hard axis and being substantially elongated;

providing a current flow along the cubic hard axis; and

detecting a transverse voltage in the epilayer responsive to said current flow at each of a plurality of transverse voltage probe pairs in contact with the epilayer, each pair having probes in contact with the epilayer on opposite sides relative to the cubic hard axis.

33. The method of claim 32, further comprising applying an in-plane magnetic field to the test sample.

34. The method of claim 33, wherein said applied magnetic field is non-aligned with the cubic hard axis.

35. The method of claim 33, wherein the applied field is fixed in magnitude, and wherein applying includes sweeping the orientation of the magnetic field relative to the cubic hard axis.

36. The method of claim 35, wherein sweeping includes sweeping the magnetic field by 2π.

37. The method of claim 33, further including applying a saturation field to the test sample before applying the in-plane magnetic field.

38. The method of claim 34, wherein the applied field is fixed in orientation relative to the cubic hard axis, and wherein the magnitude of the applied magnetic field is altered.

39. The method of claim 32, further including processing the transverse voltages detected by the transverse voltage probe pairs so as to determine one or more parameters associated with a magnetic domain wall in the epilayer.

40. The method of claim 39, wherein the one or more parameters include one of domain wall velocity and transverse magnetic resistance.

41. The method of claim 32, wherein the substrate is a GaAs substrate, and wherein the epilayer includes Mn doped GaAs ((Ga, Mn)As)).

42. The method of claim 41, wherein the concentration ratio of Ga to Mn in the epilayer is approximately 948 to 52.

43. The method of claim 41, wherein the concentration ratio of Ga to Mn is between approximately 100:1 and 100:8.

44. The method of claim 32, wherein the substrate is selected from the group consisting of GaAs and GaN.

45. The method of claim 44, the epilayer is selected from the group consisting of Mn doped GaAs and Mn doped GaN.

46. The method of claim 32, wherein the sample includes a buffer layer formed between the substrate and the epilayer.

47. The method of claim 32, wherein the substrate is a type III-V semiconductor.

48. The method of claim 47, wherein the epilayer is a type III-V semiconductor doped with Mn.

49. The composition of claim 1, wherein the substrate is a type III-V semiconductor.

50. The composition of claim 49, wherein the epilayer is a type III-V semiconductor doped with Mn.

51. The device of claim 16, wherein the substrate is a type III-V semiconductor.

52. The device of claim 51, wherein the epilayer is a type III-V semiconductor doped with Mn.